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DEFENSE EXPENDITURES AND MACROECONOMIC STABILIZATION IN PAKISTAN: A TEST OF THE MILITARY KEYNESIANISM HYPOTHESIS

by
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1. *Introduction*

Perhaps because of Pakistan's (Henderson, 1993) pursuit of nuclear capability, increased attention has focused on that country's pattern of defense expenditures. Because of the high proportion of the budget devoted to defense, the economic impact of these expenditures has also been of concern. How rapidly do Pakistani defense expenditures respond to increased Indian allocations to the military? Are the opportunity costs (in terms of foregone output and income) likely to constrain that country's military budget?

To date, preliminary research has produced several counterintuitive findings (Looney, 1991, 1995):

1. It appears that Pakistan's defense expenditures cannot merely be said to occur in response to Indian militancy. While this may have been true in the early years after independence, there is little evidence that this relationship any longer exists. In fact there appears to be a fairly close link between defense expenditures and the overall size of the economy.
2. The apparent negative impact of defense expenditures on the rate of growth in real Gross Domestic Product (especially in the 1958-73 period) may have stemmed from an overreaction to Indian defense expenditures. The net result was to compress military allocations into

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too narrow a period. The net result was to impair an efficient transfer of resources from the civilian sector.

3. During periods when Pakistan's defense expenditures are not simply a reaction to Indian defense expenditures, allocations to the military appear to have a (albeit weak) positive effect on economic growth. In addition it was found that during this period defense expenditures were expanded in line with the general expansion of the economy.

These patterns suggest that during periods when Pakistan does not have to structure its defense spending to counter that of India's, the country could expand allocations to the military in line with its resource base. The net result reduces somewhat the negative influences on the economy. While plausible, this explanation does not explain why defense expenditures have had a positive effect on GDP in recent years.

One possible explanation may lie in the manner in which the government times its allocations to the military. Several studies (Griffin, Wallace and Devine, 1982; Treddenick, 1985; and Looney, 1991a) have found that positive links between defense and the economy are often a result of "Military Keynesianism" effects (Cf. Whynes, 1979). Specifically, since defense is one item of the budget on which the government may have considerable discretionary control, expenditures on the military can often be used to stabilize the economy. That is these expenditures may increase during periods of downturn and decrease when inflationary pressures build up.

The purpose of the analysis below is to extend the earlier Military Keynesian analysis developed in this Journal (Looney, 1991a). That study used cross section analysis and as such was not able to identify many of the shorter run dynamic adjustments that may characterize the relationship between defense expenditures and the main macroeconomic aggregates. Drawing on the findings of that study and using time series data for Pakistan the main questions addressed are: whether defense expenditures have responded to economic conditions and if so has this response been to offset fluctuations in GDP and/or inflationary pressures? Has the pattern and timing of defense expenditures been fundamentally different from that of non-defense allocations and if so in what manner?

2. *Background*

Most of the literature on Military Keynesianism has focused on defense expenditures in the developed countries. For example, (Griffin, Wallace and Devine, 1982) examined defense spending patterns in the United States

between 1949 and 1976 and concluded that: "military outlays (as a percentage of GNP) do appear to be employed as a counter-cyclical fiscal instrument by the state". However, in a more recent study (Looney and Mehay, 1990) it was found that these effects may have weakened considerably in recent years.

In the case of Canada, Treddenick (1985) attempted to:

> pursue one particular line of thinking about military expenditures: namely, that the level and composition of a nation's military expenditures may be significantly influenced by domestic economic imperatives which are independent of any security considerations. Thus, military expenditures may be undertaken to promote economic objectives, but rationalized in terms of providing for national security.

Treddenick concluded that large increases in Canadian defense expenditures have been influenced more by economic than security considerations.

O'Leary and Coplin (1975) suggested that the following factors might influence defense spending patterns in Latin America:

1. Economic condition of the country;
2. role of the military in non-military affairs;
3. internal security needs;
4. arms races;
5. military budgets in rival states;
6. internal political support;
7. age, structure of existing equipment.

The only apparent correlation was between the military budget and arms races and the budget levels in rival states. Apparently, both of these factors acted as a reference point "from which individual countries might set their own budget levels".

Maizels and Nissanke (1986) attempted to quantify the major factors that have influenced military spending in 83 countries. They developed a conceptual matrix that distinguished between domestic, regional and global conflicts on the one hand, and three potential influences on military expenditures (political framework, economic linkages, and military activity) on the other. Their model was then applied for the sample countries as a whole, and for separate regions of Africa, Asia, and Latin America. Their main findings were that (Maizels and Nissanke, 1986, pp. 1137):

> The differences among developing countries in the relative size of their military burdens...appear to reflect a complex of factors – domestic, regional and global – which are not easy to disentangle and which no doubt vary in

> emphasis from country to country....Domestic factors, particularly the need perceived by ruling elites to repress internal opposition groups, and external factors, including relations with the global power blocks and the availability of foreign exchange to purchase arms from abroad, also appear to be major determinants of government decisions in regard to military expenditures.

In another major study, Harris (1986) attempted to measure the effect of domestic economic conditions since the early 1960s on military budgets in five ASEAN countries: Indonesia, Malaysia, Philippines, Singapore and Thailand. His main findings were that:

1. Defense expenditures in the current year are positively correlated with both defense spending and the central budgetary position in the previous year.
2. Current defense expenditures have a weak inverse correlation with inflation in the previous year.
3. Although current defense budgets are not correlated with the balance of payments in the previous year, the balance of payments affects government revenue which in turn affects defense spending.

David Denoon (1986) also examined defense expenditures in the ASEAN region and offered several theoretical explanations for their distinctive patterns:

1. Governments respond to actual military threats.
2. Domestic political concerns determine recruiting, the stationing of troops and levels of readiness.
3. Resources allocated to defense are determined through the government system.
4. Military-industrial complexes view for shares of the defense budget.
5. Arms races affect military budgets.

In an extension of the Harris paper, Looney and Frederiksen (1988) used time series data to examine the economical determinants of defense expenditures for ten Latin American countries: Argentina, Peru, Mexico, Venezuela, Chile, Paraguay, Uruguay, Colombia, Brazil and Ecuador. Four alternative models were tested. The independent variables were current and lagged values of GNP, government expenditure, and military expenditures. Their main findings were that much of the variability in defense expenditures can be explained by economic variables: the overall constraining GDP and fiscal funding variables.

Finally a study of defense expenditures in South East Asia (Looney and Frederiksen, 1990) tested a "Military Keynesian" model to determine the

extent to which defense expenditures had been used as tools for economic stabilization. Three basic patterns were found: stabilization or "Military Keynesianism" (Singapore), augmentation (increased expenditures with unexpected increases in resources (Malaysia), and distributed lags-increases in defense expenditures over time as a result of an expanding domestic economy (Philippines). In all countries that increased defense budgets as expected GNP increased. There were, however, significant variations between countries as to the timing of increased allocations to the military. Specifically, Thailand exhibited a weak stabilization pattern. Korean defense expenditures followed the long run distributed lag function, although as in the case of Thailand there was a weak stabilization effect.

3. *The Stabilization Model*

While the study noted above provides a useful start in assessing the manner in which countries may use defense expenditures as a stabilization tool, various economic problems arise in attempting to measure this counter-cyclical relationship.

Some or all of the variables involved could exhibit non-stationary tendencies. Also, high R^2 values may arise as a result of correlated trends and not through economic relationships. The standard method of overcoming this problem is to see whether the relationship discovered in levels persists after first differencing. The problem with such an approach is that it involves the loss of low frequency (long-run) information. The assertion that there is a long run relationship between defense expenditures and the level of economic activity in Pakistan necessitates the use of an econometric methodology that overcomes the problem of spurious regressions.

In this regard, cointegration and Error Correction Modeling (ECM) allow the identification of non-spurious relationships without forcing the loss of long-run information. Moreover, ECM allows for suitable economic interpretations since it incorporates equilibrium relationships as suggested by economic theory, along with the possibility of variables responding to short-run disequilibrium. The concept of cointegration provides the link between integrated processes and the concept of equilibrium. It was originally developed by Granger (1981) and extended by Engle and Granger (1987).

4. *Cointegration-Error Correction Tests*

More formally, if X_t and Y_t are both nonstationary in levels, but stationary in the first differences, they are said to be integrated of order one, denoted by I(1). If X_t and Y_t are both I(1), their linear combinations of the form $Z_t = X_t - \alpha Y_t$ are generally also I(1). However, if there is an α such that Z_t is integrated of order zero or I(0), the linear combination of X_t and Y_t is stationary, and the two variables are said to be cointegrated.

Engle and Granger (1987) propose several ways of testing for cointegration. In this paper we use the augmented Dickey-Fuller (1979) (ADF) test because it has good power properties for first-order and higher-order systems. The ADF test of cointegration consists of first performing the following cointegration regression:

$$X_t = c_0 + c_1 Y_t + \varepsilon_t \tag{1}$$

Then performing the following ADF regression on the residuals of equation (1)

$$\varepsilon_t - \varepsilon_{t-1} = b_1 \varepsilon_{t-1} + \sum_{i=1}^{m} (\varepsilon_{t-i} - \varepsilon_{t-i-1}) + \mu_t \tag{2}$$

The null hypothesis of no cointegration is H_0: $b_1 = 0$. If the null is rejected, X_t and Y_t are cointegrated.

The cointegration relation $X_t - \alpha Y_t = 0$ represents a long-term equilibrium relation between X_t and Y_t, and the cointegration factor Z_t can be used to measure the deviation from this long-term relation. Engle and Granger (1987) suggest estimating the value of α by performing the following regression:

$$X_t = \alpha_0 + \alpha_1 Y_t + \varepsilon_t \tag{3}$$

By knowing α_1, the cointegration factor Z_1 can be obtained from

$$Z_t = X_t - \hat{\alpha} Y_t \tag{4}$$

Engle and Granger (1987) combine the concept of causality in the Granger sense and the notion of cointegration to develop a model that allows testing for both short-term and long-term relations between two time series. The

model is the ECM. The following ECM investigates the potential long- and short-term effects of X on Y:

$$(5)\quad Y_t - Y_{t-1} = a_0 + a_1\hat{Z}_{t-1} + \sum_{i=1}^{m} b_i(X_{t-1} - X_{t-i-1}) \sum_{j=1}^{m} c_j(Y_{t-j} - Y_{t-j-1}) + \varepsilon_t$$

The ECM of the above equation decomposes the dynamic adjustments of the dependent variable Y into two components. The first is a long-term component given by the cointegration term

$$a_1\hat{Z}_{t-1}$$

also known as the error correction term. The correction adjustments of Y_t to a disequilibrium error from the previous period Z_{t-1} can be spread over several periods, with the coefficient a_1 indicating the speed of the correction mechanism. The second component is a short-term component given by the summation terms on the right-hand side of equation (5). These two terms represent past changes in X and Y and characterize the short-term dynamics. Specifically, the first summation term in equation (5) gives the short-term effect of X on Y.

Similarly, the following ECM expresses the long- and short-term effects of Y on X:

$$(6)\quad X_t - X_{t-1} = \alpha_0 + \alpha_1\hat{Z}_{t-1} + \sum_{i=1}^{m} \phi_i(Y_{t-i} - Y_{t-i-1}) \sum_{j=1}^{m} \Omega_j(X_{t-j} - X_{t-j-1}) + \mu_t$$

From equations (5) and (6) it follows that X_t and Y_t are cointegrated when at least one of the coefficients a_1 or α_1 is different from zero. In this case, X_t and Y_t exhibit long-term comovements. When a_1 is different from zero but α_1 is zero, Y_t follows and adjusts to X_t in the long term. The opposite occurs when α_1 is different from zero but a_1 is zero. When both coefficients, a_1 and α_1 are different from zero, a feedback exists and the two variables adjust to one another over the long term.

The coefficients b_i's and ϕ_i's represent the short-term relation between X_t and Y_t. When b_i's are not all zero but all ϕ_i's are zero, X is leading or causing Y in the short term. The reverse is true when ϕ_i's are not all zero but all b_i's are zero. When both events occur, a feedback exists and the two variables affect each other in the short term.

A key issue in error correction cointegration analysis is the specification of an optimal lag structure for the autoregressive model (the author is indebted to an anonymous referee for suggesting this approach). Here we have used the (ARDL) procedure developed by Pesaran and Pesaran (1997). Essentially the procedure begins with the selection of a fairly long lag period. The Schwartz Bayesian criterion is then used to determine the optimal lag pattern. The program then provides estimates of the error correction model (ECM) which corresponds to the selected ARDL model.

5. *Results*

The ADF tests of the key variables in the system: Gross Domestic Product (*GDPNP*), inflation (*GDPDF*), as proxied by the *GDP* deflator, total government expenditures (*GEP*); military expenditures (*MILXP*) and non military expenditures (*NILXP*) indicated that these variables were non-stationary in their levels but stationary in their first differences. In addition to these variables a structural shift dummy (*DUM3*), representing the period before and after the break up of East and West Pakistan (0, 1960-1971; 1, 1972-1995) was added to the analysis to capture possible changes in budgetary priorities associated with the splitting up of the country and or wars with India. All of the variables except the *GDP* deflator are in 1995 constant prices.

The error-correction cointegration analysis (ARDL) was first undertaken for the period as a whole (1960-1996), and each of the three major categories of government expenditures, Total government expenditures (*GEP*), Defense expenditures (*MILXP*), and Non-defense (*NILXP*) expenditures (Table 1):

1. A common pattern characterizes the long-run relationship between the various types of government expenditures and the macroeconomy. As evidenced by the statistical significance of the error correction term (*ecm*-1), a long run relationship exists for each of the major categories of government expenditures. Specifically it implies that government expenditures are cointegrated with Gross Domestic Product and the GDP deflator.
2. In addition, the negative sign on the error correction term implies that if government expenditures are above their equilibrium level they will decline. This is what would be expected if during periods of rapid economic growth they overshoot their long run equilibrium. On the other hand if they are below their long run equilibrium, there is apparently political pressure for expanded fiscal allocations.

Table 1. Pakistan: ARDL cointegration analysis, error correction representation, 1960-95

Dependent Variable: Total Government Expenditures (*GEP*)			
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
GDPDF	77.915	53.738	1.449[.159]
GDPNP	0.294	0.046	6.357[.000]
DUM3	–4.692	3.373	–1.391[.176]
INPT	–41.526	7.432	–5.587[.000]
ecm(–1)	–0.697	0.129	–5.380[.000]

ARDL(1,1,0,0) selected based on Schwarz Bayesian Criterion
GEP = *GEP*-*GEP*(–1); *GDPDF* = *GDPDF*–*GDPDF*(–1); *GDPNP* = *GDPNP*–*GDPNP*(–1)
DUM3 = *DUM3*–*DUM3*(–1); *INPT* = *INPT*–*INPT*(–1)
ecm = *GEP* + 103.8395**GDPDF* – .42289**GDPNP* + 6.7295**DUM3* + 59.5510**INPT*
R-Squared = 0.675; *R*-Bar-Squared = 0.613; *F*-stat. = 13.543[.000]

Dependent Variable: Defense Expenditures (*MILXP*)			
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
*MILXP*1	0.385	0.138	2.789[.010]
GDPDF	–62.982	13.664	–4.609[.000]
GDPNP	0.064	0.015	4.245[.000]
DUM3	3.104	0.928	3.345[.003]
INPT	–5.260	2.055	–2.559[.017]
ecm(–1)	–0.683	0.137	–4.981[.000]

ARDL(2,1,0,0) selected based on Schwarz Bayesian Criterion
MILXP = *MILXP*–*MILXP*(–1); *MILXP*1 = *MILXP*(–1) –*MILXP*(–2);
GDPDF = *GDPDF*–*GDPDF*(–1); *GDPNP* = *GDPNP*-*GDPNP*(–1);
DUM3 = *DUM3*–*DUM3*(–1); *INPT* = *INPT*–*INPT*(–1)
ecm = *MILXP* + 13.674**GDPDF* – .094**GDPNP* – 4.541**DUM3* + 7.695**INPT*
R-Squared = 0.685; *R*-Bar-Squared = 0.610; *F*-Statistic = 10.898[.000]

Dependent Variable: Non-Defense Expenditures (*NILXP*)			
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
GDPDF	135.840	57.760	2.351[.026]
GDPNP	0.213	0.041	5.205[.000]
DUM3	–7.295	3.924	–1.858[.074]
INPT	–34.156	7.385	–4.624[.000]
ecm(–1)	–0.647	0.141	–4.565[.000]

ARDL(1,1,0,0) selected based on Schwarz Bayesian Criterion
NILXP = *NILXP*–*NILXP*(–1); *GDPDF* = *GDPDF*–*GDPDF*(–1);
GDPNP = *GDPNP*–*GDPNP*(–1); *DUM3* = *DUM3* –*DUM3*(-1); *INPT* = *INPT* – *INPT*(–1)
ecm = *NILXP* + 90.855**GDPDF* – 0.329**GDPNP* + 11.263**DUM3* + 52.736**INPT*
R-Squared = 0.606; *R*-Bar-Squared = 0.531; *F*-stat. *F*(4, 27) 10.0371[.000]

3. Considerably more variation characterizes the manner in which each category of expenditures adjusts to shorter run movements in GDP and inflation. Specifically total expenditures do not appear to react to inflationary pressure, whereas defense expenditures decline with increases in inflation. In contrast non-defense expenditures increase in line with price increases.
4. Another source of variation is associated with the break in the data around 1971/72, depicted by the dummy variable *DUM3*. For total expenditures, this term is not statistically significant. However it is positive and significant for defense expenditures and negative and significant (at the 90% level) for non-defense expenditures. Apparently, ceteris paribus, governments after 1971 were more inclined to spend on defense, and less on non-defense.

Tentatively these results suggest that for stabilization purposes the Government of Pakistan distinguishes between the two broad categories of government expenditure, defense and non-defense. Furthermore, the authorities appear more willing to use defense expenditures as a counter-cyclical tool, but here largely to offset inflationary pressures rather than fluctuations in real output. These budgetary patterns may have become stronger over time, especially after the breakup of the country in the early 1970s.

As a next step in the analysis, separate tests were undertaken for an earlier (1960-80) and later (1975-1995) twenty year interval. In part, the purpose of this analysis is to provide a closer examination of the nature of the shift in budgetary priorities in the early 1970s. For defense expenditures, several interesting contrasts emerge (Table 2):

1. Again the statistical significance and negative sign on the error correction term for both time periods, suggests that defense maintains a long run relationship with the underlying economic base and that some of its short run movements are to correct for deviations from that longer run equilibrium pattern. However, as noted by the significance of the dummy variable for the entire period, the nature of this relationship has changed with time.
2. In the earlier twenty-year period (1960-1980), defense expenditures appear a bit erratic, with a plus and minus signs on the GDP . This suggests an inconsistent stabilization pattern occurred, no doubt due to the conflicts with India during this period. Short run defense expenditures also expanded and contracted in line with inflationary pressures.

Table 2. Pakistan: ARDL cointegration analysis of defense expenditures error correction representation

Dependent Variable: Defense Expenditures (*MILXP*), 1960-1980

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
*MILXP*1	2.459	0.589	4.171[.006]
*MILXP*2	1.987	0.685	2.900[.027]
GDPDF	167.165	63.062	2.650[.038]
*GDPDF*1	364.795	97.667	3.735[.010]
*GDPDF*2	125.705	86.331	1.456[.196]
GDPNP	0.149	0.073	2.040[.087]
*GDPNP*1	–0.575	0.143	–3.998[.007]
*GDPNP*2	–0.549	0.154	–3.567[.012]
*GDPNP*3	–0.211	0.079	–2.672[.037]
INPT	–78.469	22.796	–3.442[.014]
ecm(–1)	–4.426	1.074	–4.120[.006]

ARDL(3,3,4) selected based on Schwarz Bayesian Criterion
MILXP = *MILXP*–*MILXP*(–1); *MILXP*1 = *MILXP*(–1)–*MILXP*(–2);
*MILXP*2 = *MILXP*(–2) –*MILXP*(–3); *GDPDF* = *GDPDF*–*GDPDF*(–1);
*GDPDF*1 = *GDPDF*(–1) –*GDPDF*(–2); *GDPDF*2 = *GDPDF*(–2) –*GDPDF*(–3)
GDPNP = *GDPNP*–*GDPNP*(–1); *GDPNP*1 = *GDPNP*(–1) –*GDPNP*(–2)
*GDPNP*2 = *GDPNP*(–2) –*GDPNP*(–3); *GDPNP*3 = *GDPNP*(–3) –*GDPNP*(–4)
INPT = *INPT*-*INPT*(–1)
ecm = *MILXP* + 36.2165**GDPDF* –.14030**GDPNP* + 17.7258**INPT*
R-Squared = 0.916; *R*-Bar-Squared = 0.667; *F*-Statistic = 4.4142[.041]

Dependent Variable: Defense Expenditures (*MILXP*), 1975-1995

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
*MILXP*1	0.438	0.183	2.387[.030]
GDPDF	–66.160	14.446	–4.579[.000]
GDPNP	0.061	0.0182	3.364[.004]
INPT	–2.099	1.901	–1.104[.286]
ecm(–1)	–0.680	0.185	–3.666[.002]

ARDL(2,1,0) selected based on Schwarz Bayesian Criterion
MILXP = *MILXP*–*MILXP*(–1); *MILXP*1 = *MILXP*(–1) –*MILXP*(–2)
GDPDF = *GDPDF*–*GDPDF*(–1); *GDPNP* = *GDPNP*–*GDPNP*(–1)
INPT = *INPT*–*INPT*(–1);
ecm = *MILXP* + 10.0844**GDPDF* – .090408**GDPNP* + 3.0868**INPT*
R-Squared = 0.737; *R*-Bar-Squared = 0.649; *F*-statistic = 10.5275[.000]

3. In the latter twenty year period (1975-1995) this pattern is much clearer, with defense playing a consistent role in offsetting inflationary pressures.

For non-defense expenditures (Table 3)

1. As with defense, a long run pattern exists with economic activity for each of the periods (1960-1980, 1975-1995). However, shorter run movements in expenditures in the earlier period are not clearly associated with any systematic stabilization effort. Specifically, the varying signs for the lagged values of GDP and inflation suggest that the government may have altered whatever stabilization function it had assigned to non-defense allocations.
2. In the latter period, however the pattern observed for the period as a whole again emerges, except that the positive link between the GDP deflator and non-defense expenditures is significant at only the 90% level. As with the period as a whole, non-defense expenditures do not play an important role in offsetting movements in either GDP or inflation.

6. *Conclusions*

Historically, conventional wisdom has assumed that political/strategic factors dominate year-to-year variations in Third World military expenditures. Recent empirical studies, however, have suggested that economic variables may play an important, if not dominant, role in structuring budgetary allocations to the military. The findings presented above lend some support to this view. In particular Pakistan exhibits long intervals during which defense moves in line with resource availability. While year to year security needs must account for some of the shorter run movements in defense, it is clear that these too are controlled by the economic environment. The first can be attributed to a budgetary adjustment mechanism to control for over or undershooting of defense with the underlying economic base. The second reflects the use of defense as a stabilization tool, especially during periods of relative peace with India. This interpretation is consistent with the earlier finding that defense had a negative impact on the economy during the periods of conflict, shifting to a positive stimulus during more peaceful times.

Table 3. Pakistan: ARDL cointegration analysis of non-defense expenditures error correction representation

Dependent Variable: Defense Expenditures (*MILXP*), 1960-1980

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
*NILXP*1	3.110	1.355	2.294[.083]
*NILXP*2	2.644	1.161	2.277[.085]
*NILXP*3	1.204	0.768	1.566[.192]
GDPDF	–601.123	205.860	–2.920[.043]
*GDPDF*1	7.345	136.361	0.053[.960]
*GDPDF*2	–19.137	138.142	-0.138[.897]
*GDPDF*3	244.005	155.203	1.572[.191]
GDPNP	0.646	0.178	3.630[.022]
*GDPNP*1	0.141	0.116	1.215[.291]
*GDPNP*2	0.047	0.145	0.327[.760]
*GDPNP*3	–0.143	0.150	–0.948[.397]
INPT	–90.885	49.449	–1.837[.140]
ecm(–1)	–4.495	1.712	–2.624[.059]

ARDL(4,4,4) selected based on Schwarz Bayesian Criterion
NILXP = *NILXP*–*NILXP*(–1); *NILXP*1 = *NILXP*(–1) –*NILXP*(–2);
*NILXP*2 = *NILXP*(–2) –*NILXP*(–3);*NILXP*3 = *NILXP*(–3) –*NILXP*(–4);
GDPDF = *GDPDF*–*GDPDF*(–1); *GDPDF*1 = *GDPDF*(–1) –*GDPDF*(–2)
*GDPDF*2 = *GDPDF*(–2) –*GDPDF*(-3); *GDPDF*3 = *GDPDF*(–3) –*GDPDF*(–4)
GDPNP = *GDPNP*–*GDPNP*(–1); *GDPNP*1 = *GDPNP*(–1) –*GDPNP*(–2)
*GDPNP*2 = *GDPNP*(–2) –*GDPNP*(–3); *GDPNP*3 = *GDPNP*(–3) –*GDPNP*(–4)
INPT = *INPT*–INPT(–1);
ecm = *NILXP* + 46.4321**GDPDF* –.19615**GDPNP* + 20.2158**INPT*
R-Squared = 0.961; *R*-Bar-Squared = 0.694 *F*-statistic = 4.193[.089]

Dependent Variable: Non-Defense Expenditures (*NILXP*), 1975-1995

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
GDPDF	132.472	72.761	1.820[.086]
GDPNP	0.208	0.050	4.170[.001]
INPT	–40.936	11.015	–3.716[.002]
ecm(-1)	–0.629	0.183	–3.422[.003]

ARDL(1,1,0) selected based on Schwarz Bayesian Criterion
NILXP = *NILXP*–*NILXP*(–1); *GDPDF* = *GDPDF*–*GDPDF*(–1)
GDPNP = *GDPNP*–*GDPNP*(–1); *INPT* = *INPT*–*INPT*(–1)
ecm = *NILXP* + 90.5486**GDPDF* –.33112**GDPNP* + 65.0014**INPT*
R-Squared = 0.558; *R*-Bar-Squared = 0.448; *F*-statistic = 6.746[.003]

Finally one can only speculate as to why defense and not non-defense expenditures have been utilized by the authorities as a stabilization tool. One explanation is that defense is more discretionary in that procurements can be postponed or speeded up as the need arises. Non defense expenditures on the other hand, especially in areas like health, education and the like are longer run commitments and therefore difficult to expand and contract in the shorter term. Another explanation is that the diversity of non-defense expenditures might mask any pattern for the category as a whole. This would be a productive area to examine for future research.

On the other hand, it appears that during non-arms race periods defense expenditures may be carefully controlled by the government, both as a means of avoiding fiscal stress and also for purposes of economic stabilization. If this is in fact the case, defense expenditures might be expected to actually produce a positive stimulus to the country's economic expansion.

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ABSTRACT

This paper examines Pakistani defense expenditures from the perspective of whether that country's allocations to the military have responded to economic conditions and if so has this response been to offset fluctuations in GDP and/or inflationary pressures? The main findings suggest that Pakistan experiences long intervals during which defense expenditures move in line with resource availability. While year to year security needs must account for some of the shorter run movements in defense, it is clear that these too are controlled by the economic environment. The first can be attributed to the budgetary adjustment mechanism to control for over or undershooting of defense with the underlying economic base. The second reflects the use of defense as a stabilization tool, especially during periods of relative peace with India. This interpretation is consistent with the earlier finding that defense had a negative impact on the economy during the periods of conflicts, shifting to a positive stimulus during more peaceful times.

JEL classification: *E6, E1, E3*
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